EMERGENCY BLOOD TYPING IN THE FIELD DURING WORLD WAR II: A PERSONAL NARRATIVE

SAMUEL BERG, M.D.
Newark, New Jersey

My interest in hematology began soon after I graduated from Bellevue-New York University Medical College in 1921. Before an internship in Newark City Hospital, I served in Dr. Harrison S. Martland's laboratory.

In those years, Essex County, and especially Newark, had the highest concentration of the basic chemical industries in the United States, manufacturing toxic substances and causing many anemias and leukemias. Dr. Martland saw many of these patients on the wards of Newark City Hospital, and he performed autopsies in all such deaths with permission of the coroner. The only way to relieve symptoms and to prolong life in severe anemia at the time were the two transfusion teams, one headed by Dr. Joseph Echickson and the other by Dr. Asher Yaguda. (I assisted the latter.) Transfusions were by the direct Lindemann method and just before the time of World War II by the indirect citrate method, which permitted establishment of blood banks. On one occasion, while Asher and I were transfusing a patient with pernicious anemia for the ninth time he remarked, "I hope this will be my last transfusion. I have an appointment with a Dr. Minot in Boston next week. I understand he is getting good results by feeding his pernicious anemia patients one pound of liver daily." Dr. Yaguda remarked that it sounded like another fad.

Pearl Harbor was bombed on December 7, 1941, and in February 1942 I volunteered for service. In May I received orders to report to Fort Sam Houston, Texas, and in June to report to the 202nd Field Artillery at Camp Gruber, Oklahoma. I was the only physician in the regiment of 1,200 men, a disappointing assignment, strenuous and exhausting. My curriculum vitae caught up with the military, and I was transferred to the 5th Medical Laboratory. There, we performed mostly bacteriology on diarrheal stools, drinking water and food.

In January and February 1943 our unit was in the Desert Training Area in Southern California, where troops were training for warfare in North Africa. I received orders to type the blood of these soldiers under extremely adverse conditions, to be detailed later.

On several occasions after the war, I read that blood types as recorded on dog-tags were inaccurate from 5 to 10% of the time. Knowing the conditions I worked under, I am sure that I was responsible for some of the incorrect typings, yet my conscience did not bother me. But as time went on and the criticism continued, my resentment increased. Then, in 1958, an item in the *New York Times* was particularly vexing. The title was "10% of Dog-Tags Incorrect, Specialist Tells Meeting." Part of the text read, "At a session of the American College of Surgeons in New York, Dr. Alexander Wiener remarked at a symposium that, luckily, no one took the dog-tags seriously."

In view of Dr. Wiener's prestige and authority, that criticism offended me. I wrote him a long letter after three years of stewing over his remarks.

28 April 1961

Dear Dr. Wiener:

In searching for an article in a batch of reprints recently, I found a mislaid newspaper clipping from the 7 March 1958 issue of the *New York Times* which began quote "About 10% of the blood groups on dog-tags worn during World War II were wrong, Dr. Alexander Wiener estimated here yesterday afternoon, who spoke at a closing session of the American College of Surgeons New York sectional meeting" end quote. I certainly do not disagree with your estimate; in fact, it might be too conservative.

The item continues with the disparaging remark-quote- "Luckily, no one took the dog-tags seriously"- end quote-, and this is when I experienced a flushing of anger, because little or nothing is known of the circumstances under which some of the typings were performed, and the reasons for error. Now that I read the clipping after an interval of three years and experience the same reaction, I shall take the liberty of informing you of the difficulties under which some of the typing units functioned, and perhaps you might feel less critical of those responsible for performing these tests.

I was the medical officer in charge of the Blood Typing Unit of the 5th Medical Laboratory, stationed in the Desert Training Center in Southern California in the early months of 1943. Beside myself, the unit had a truck driver and several medical technicians.

As for conditions at the time and place, the days were intensely hot, so much so that we had to put ice in the bacteriological incubators to maintain a temperature of 37° C. The air was so dry that typing reactions had to be read within a minute before the serum and erythrocyte suspension dried sufficiently to give false clumping. Worst of all were the wind storms, which would blow the finest powdery sand on to and into everything.

But were we in a position to protest that blood typing was impossible under the circumstances? Dr. Wiener, when an officer receives orders to type the personnel of a unit, he performs the typings and submits the results. You might be half way through typing 200 men in one location and receive a message to proceed at once sixty miles away to another unit, both units ordered to proceed forthwith to the port of embarcation without ever being alerted, and both needing blood typings before leaving the United States in accordance with regulations. So you proceed from bedlam to bedlam and do the best you can. My records show that we typed anywhere from 152 to

1,200 men in one day, and I read them all, besides coordinating all the activities necessary to carry out our function.

It was not an uncommon occurrence to be watching a movie in the evening and hear the loud speaker announce, "Fifth Med Lab Blood Typing Unit report to your headquarters immediately." There we would get orders to proceed at once to such and such a unit fifty miles distant. Well, Sir, riding in a 6 × 6 truck at night in the desert in frigid air over unmarked roads, such as they were after extensive tank maneuvers, is not a very pleasant experience, and not conducive to critical agglutination testing. It might be 2 a.m. when the unit is located in the process of breaking camp and preparing to move, with a howling wind and sand-storm raging. On such occasions the typings were done in the truck, with slides placed on a piece of paper in the truck floor. Soldiers stepped up onto the tail-board, pulled aside the canvas flap, and let themselves in along with wind and sand. Names and serial numbers were recorded and blood typings performed by the light of a Coleman lantern, if available and in working order, otherwise by flashlight. You dealt with cold, wind, sand, fatigue, disorder, time frustration, but you carrried out the orders to the best of your ability. I know the typing results submitted by me accounted for an appreciable percentage of the errors, and I doubt if you could have done better under the circumstances.

Now, Dr. Wiener, if there is ever occasion again when you might remark that the blood typings of soldiers in World War II are not too reliable, please soften the criticism by explaining that some of the test were performed under conditions which you would consider unsatisfactory, let alone intolerable. But, Sir, c'est la guerre.

With kindest regards,
Samuel Berg, M.D.

Ten days later, I received a reply.

Dear Dr. Berg:

Your letter of April 28th is most interesting and greatly appreciated. I think its contents are most informative and instructive. If any fault exists regarding the error in blood grouping made in grouping of the Armed Forces in World War II, this should be ascribed, not to the officers working under difficulties in the field, but to those responsible for the planning which caused such errors to occur. I was one of those who attended the NCR meeting at which the techniques for "mass" blood grouping were designed. The whole plan went against my grain, but unfortunately, I did not speak up at the time as I have done about other matters more recently.

I think the contents of your letter would be instructive reading to all physicians and may prevent a repetition of the same mistakes. Why don't you send it to Dr. J. Talbott, editor of the Journal of the American Medical Association, in the form of a letter to the editor for publication?

Sincerely yours,
A.S. Wiener

My letter to Dr. Wiener listed a number of factors that militated against the accurate performance of any typing procedure. I was the only individual on the team with the credentials and authority to read about 9,000 reactions

within a period of about 28 days. Full responsibility for carrying out the order was placed on me. To have protested the conditions verbally or by failure to fulfill the urgent assignment would have been direct disobedience during wartime.

Speed was enforced by military command and was not an environmental factor such as sand. At the beach, the sand is mostly particulate; in the desert, wind storms reduce it to powder, which gets into everything. On several occasions during storms at night, I read typing reactions on hands and knees on the floor of our truck, a microscope with a flashlight directed to its mirror in front of me, and a canvas tarp thrown over me and the equipment to prevent sand from mixing with blood typing reagents. The slides were prepared under similar precautions and passed under the tarp to me.

Worst of all was the avidity of the dry air for moisture. So strong was this that if a wet handkerchief were waved briskly, it dried in 60 seconds. To accomplish mass typings, technicians marked slides for identification, placed the mixtures of blood and sera thereon and passed them to me at once for reading. There was no time for delayed reactions, no time to add saline in case of rapid drying. Most of the difficulties were due to circumstances originating in military orders. The most critical factor of the many that interfered with accurate typing could be considered in a mathematical equation, the numerator being the number of soldiers to be typed and the denominator being the time provided for its accomplishment.

I often noted briefly on scraps of paper the number of typings and the circumstances under which some were done. During the next four years I carried them in my luggage to Australia, island hopping across New Guinea, to Manila and Nagasaki, and then back to the states. I shall present four days of activity as I recorded them on tear-sheets.

> *Jan. 29, 1943.* At 6th Armored Div. Col. Eddy, M.C., came in on three occasions to watch the typing team work. Saw me read 50 in 20 minutes. Also leave slide on microscope, walk away to show him something, return, meanwhile the team putting prepared slides down, and he saw that by our systems no error in identification was possible. Ten medical captains and lieutenants came by to see the team in action. All took notes on the procedure. Col. Eddy requested a description of my technique, sent Capt. Treadwell to write it down, but I typed it and sent a diagram also.
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> *Jan. 30, 1943.* To 4th Arm. Div.,.... Established team at 46th Med. Bn. Began typing at 9.40 a.m., ran through 61 cases in 27 minutes, then 51 cases in 23 minutes. Had lunch and proceeded to 86th Ar Recon, typed 18. Phoned surgeon at Camp Young and informed him there was a QM unit to be typed, to determine which one and have it provide board and overnight bivouac for our unit. Departed from 86th Arm Recon

at 3.05 p.m., arrived Camp Young 4 p.m. Met Lt. Col. Iterman, Surgeon DTC. Col. Shelton now Surgeon IV Army Corps. Informed that 305th QM (S & B) was to be typed. Did 122 typings from 4.27 to 5.26 p.m. Had mess. Went to assigned tent and made notes.

Jan. 31, 1943. More typings of 305th QM in morning, 137 in Co. B and 141 in Co. D. In afternoon to Station Hospital; typed 24 men from 305th, then went from ward to ward, typed 45 in 14 wards who were from various units who had never been typed, decided this was too time-consuming.

Feb. 12, 1943. At Knob, near Yuma, Arizona. Wind storm all night, continues this morning. Ward tent taken for court-martial, mess tent taken for umpire lectures, so pitched my own pyramidal tent for typings. Typed 103 cases from 8.54 to 9.32 a.m. Typed 112 cases from 10.04 to 10.33. Started for Desert Training Center at 12.43 p.m. At 4 p.m. we encountered a white truck stranded with brake trouble near Quartzile, Arizona, towed it to Army Air base in Blythe. Bivouaced there overnight.

Feb. 13, 1943. To VIth Arm. Div., arrived 12.30 p.m. Lunched, pitched tent and began typings at 1.30 p.m., did 421 until 4.30 p.m. Supper. To Camp Young, arrived 7 p.m., overnight with 305th QM.

The following February typings will be abridged:

Feb.	*No. Units*	*Typings*
15th	11	782
17th	4	817
18th	1 (537th QM)	1,000
22nd	Miscellaneous	6
24th	5	705
		3,310

From my extant notes, the typings during the one day in January and 10 days in February total 4,595. The numbers within the allotted time were by military command; the conditions under which they were performed were known by the military command.

Army Circular Letter No. 170 dated 2 Dec. 1942 admitted to the continued difficulties stated in Letter No. 112, and added quote "Necessary as it was, the blood grouping program was one more thing to interfere with the training of troops. Many installations therefore devised their own methods of expediting the procedure. In some, unfortunately, the haste led to confusion, and confusion led to errors, a certain proportion of which could be explained in this way. . . ."

This publication then discusses other matters and later states:

"The 5 to 10% error in blood grouping was unfortunate and undesirable, but it might have been expected for a number of reasons: the lack of avidity of the typing serum,

> the utilization of antibody from rabbit serum that was not always as good as it might have been, and the inexperience of the personnel who did the typing. One source of errors has already been intimated, the fact that in many camps and posts during the war, the personnel responsible for mass typing, through a mistaken sense of values, placed high on their priority list the speed with which the typing was done. Speed led to confusion, and confusion produced errors, which were compounded by the lack of experience of those doing the typing."

(Office of the Surgeon General, *Blood Programs in World War II.* Washington, D.C., Dept. of the Army, 1964, ch. 1.)

The trials and tribulations presented during the assigned duties of the 5th Medical Laboratory Typing Unit during January and February 1943 explain incorrect interpretations of typing reactions. As an obedient soldier, I appreciated the significance of the obligatory word "will" in the command "You will proceed to record the blood types of so and so" in order to comply with AR 40-1715 before transfer overseas. As the responsible medical officer of the Unit, I feel no guilt. If I had to prove my contention that there were some days and nights when we were sent out to execute Mission Impossible, I would call as witnesses the following capable and loyal associates: Tech. Sgts.—Marvin Hope and Russel B. Stevens, Cpls.— Harold W. Frazier, Claude Premo, Elmer Rathbun, Floyd C. Webb and Henry Witte, Pfcs—Richard S. Bunn and Ray F. Garner.

We were there.